Advancing Proactive Coastal Zone Management in the VI:
Building Local Agency GIS Capacity

Submitted by:
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SECTION I: BACKGROUND AND INTRODUCTION

The Virgin Islands Coastal Zone Management Act was passed by the U.S. Virgin Islands Legislature in 1978, as a means of regulating development and managing coastal resources in the territory. The mission of the Division of Coastal Zone Management (CZM) is to protect, maintain, preserve, enhance and restore the overall quality of the environment in the coastal zone (V.I. Code Title 12, Section 904(h)). CZM's motto "managing our coastal resources for the future" encapsulates the Division's goal of sustainable management for all aspects of our coastal resources. Successful resource management can provide many benefits - higher quality tourist experiences, strengthened fisheries, increased educational opportunities for locals and visitors and an enhanced quality of life. Additionally, CZM is the VI government's point of contact for the United States Coral Reef Task Force (USCRTF).

In the past several years, the VI CZM program has experienced significant growth. Along with increases in staff there have been increases in the diversity and scope of projects. Currently the CZM program has several different sub-programs and projects. These programs are varied and include the CZM permitting program, marine park management, coastal zone planning, education and outreach efforts and a Nonpoint Source Pollution program. While the CZM Program is meeting goals, it has not reached its full potential because of a lack of GIS capability.

CZM has existing data relevant to several programs (mainly land-based) that it implements and has a significant amount of historical data that must be entered into the Division's MS Access database. CZM has become more involved with the USCRTF and has begun to implement several projects, some of which are aimed at collecting data on our land and marine resources, or the influences on them. In order for CZM to better translate the relevant science and other information that the Division, project partners, and others, either have or are collecting, into sound management policies, this information must be standardized and compiled into a comprehensive database or database system with a significant geospatial component. To date, this synthesis of existing data has not occurred. As a result the CZM program's ability to adaptively manage the coastal zone is impaired.

A primary goal of this proposed project would be to fill this GIS capability gap, thereby allowing the VI CZM program to move to the next level and employ adaptive management and proactive planning techniques. The development of this database is one element of this project which will begin to address the lack of GIS capability. Without addressing this need, many land and marine-based projects that are currently stalled due to CZM's lack of GIS capabilities will remain stalled. It is envisioned that as part of this project the GIS Fellow will develop this comprehensive database and GIS program. A comprehensive database and GIS program that incorporates existing knowledge on our land and marine resources will allow us to identify information gaps, better plan and execute monitoring programs, and use the data to inform management and policy.

The other principal goal of this project is to make the information that is in the comprehensive database useable and accessible to CZM and Department resource managers as a mechanism to support CZM programs. This may involve upgrading existing hardware and software; training relevant CZM personnel in simple map-making, data entry, understanding metadata, querying,

and data-mining techniques; creating maps and other products for special events and exhibits; and assisting personnel in making materials that can be used to educate resource managers, policy makers and the general public. Through collaboration with staff, the GIS Fellow will provide this training and guidance and assist in designing projects so relevant information that addresses specific questions is acquired. Through training and program support the GIS Fellow will increase the capacity of CZM staff to utilize geospatial data to inform coastal zone planning, another component of the growing CZM program which has been missing. This increased capacity will translate to more effective planning and management on a Division-wide level.

II. GOALS AND OBJECTIVES

Goal 1: Creation of a comprehensive divisional database and GIS Program that can be utilized to meet various duties and responsibilities:

A. Management – use database and related GIS materials to provide information to managers for refinement of projects and to meet project goals
   1. Spatial patterns for scientific monitoring
      Objectives:
      i. NOAA Habitat Maps – Compile data and create necessary database for refining NOAA Habitat Maps as needed by the Planning and Marine Park Offices (3 mo. to ongoing)
      ii. Use NOAA Habitat Maps for locating appropriate environmental (biological, water quality, etc.) sites (3 mo. to ongoing)
      iii. Train appropriate staff to input and use relevant data (ongoing)

   2. Marine Resource Use Patterns (commercial, recreational, visitor) for management purposes
      Objectives:
      i. Create and maintain database to capture spatial information derived from surveys targeting relevant user groups (3 months to ongoing)
      ii. Train appropriate staff to input and use relevant data (ongoing)

B. Planning – use data and related GIS materials to identify new, and refine existing managed areas
   1. Spatial Use patterns (land use/zoning/etc.)
      Objectives:
      i. Compile data; create and maintain necessary database on land use and zoning within specific APC watersheds (6 months to ongoing)
      ii. Use database to aid in or assist in prioritization of existing management areas (ongoing after 6 months)
      iii. Use data to refine identified/existing managed areas (ongoing after 6 months)
      iv. Train appropriate staff to input and use relevant data (ongoing)

   2. Watershed Characterizations for APCs, including environmental valuations, scarcity, habitat delineations, and spatial use patterns
      Objectives:

i. Compile data and create databases on identified managed areas, including environmental evaluations, scarcity, and habitat delineations
ii. Use database to assist in prioritization of existing management areas (ongoing after 6 months)
iii. Use database to aid in developing management plans for areas prioritized in above step.
iv. Train appropriate staff to input and use relevant data (ongoing)

Goal 2: Staff Training for gathering data, utilizing software to analyze data:
CZM recognizes that the daily use of GIS within the Division is required to move many projects and programs forward. To that end the GIS Fellow will be expected to assist staff on an ongoing basis to develop and improve their skills so many routine requests can be handled by individual staff.

Objectives:

i. Staff trained in the basic requirements of obtaining data for use by CZM (GIS, metadata) (6 months to ongoing)
ii. Staff capable of basic manipulation of data to obtain results needed for individual offices (Planning or Marine Park) (ongoing)

Goal 3: Creation of a NEMO Working Group composed of CZM staff and staff from other divisions within the Department of Planning and Natural Resources, staff from UVI and other local agencies (Water and Power Authority, Waste Management Authority, Department of Public Works, and the Lt. Governor's Office), the Territorial Non-Point Source Pollution Committee and others.

As stated, there are a number of agencies that are involved in GIS-related work in the Territory. These agencies, however, do not collaborate closely on GIS projects and there is no forum through which various ideas, projects, concepts and training can be exchanged. The Division anticipates that the GIS Fellow will assist in CZM's efforts to create a NEMO Working Group and take the lead in organizing a sub-group of GIS professionals that can support the NEMO process.

Objectives:

i. Contact individuals and agencies and organize a GIS networking group with GIS technicians from various governmental, non-governmental and non-profit agencies to support Territorial NEMO efforts (1 year)
ii. Develop an organizational structure for a GIS/NEMO working group
iii. Coordinate regular meetings and identify collaborative projects and opportunities.
iv. Identify grants and funding to strengthen NEMO network within the territory. (2 years)

III. MILESTONES AND OUTCOMES

As described above, CZM is seeking a qualified individual that can begin developing a GIS office within the Division. While much of the infrastructure that is needed for such an office has been acquired over the last few years (i.e., software, data, shapefiles, NOAA habitat maps, other GIS data, aerial overflight photographs, computers, plotters, scanner, etc.), without the

development of the human capacity much of this material will continue to be unused. It is expected that the following timeline will be followed:

August 2006 to November 2006:

- Become familiar with facilities and update equipment and software as needed.
- NOAA Habitat Maps – Compile data and create necessary database for refining NOAA Habitat Maps as needed by the Planning and Marine Park Offices
- Train appropriate staff to input and use environmental data (ongoing)

November 2006 to August 2007:

- Use NOAA Habitat Maps for locating appropriate environmental (biological, water quality, etc.) sites (3 mo. to ongoing)
- Create and maintain database to capture spatial information derived from surveys targeting relevant user groups (3 months to ongoing)
- Compile data; create and maintain necessary database on land use and zoning within specific APC watersheds (6 months to ongoing)
- Use database to aid in or assist in prioritization of existing management areas (ongoing after 6 months)
- Staff trained in the basic requirements of obtaining data for use by CZM (GIS, metadata) (6 months)
- Staff capable of basic manipulation of data to obtain results needed for individual offices (Planning or Marine Park) (ongoing)

August 2007 to August 2008

- Continue ongoing work as needed above
- Contact individuals and agencies and organize a GIS Working Group to support Territorial NEMO efforts
- Research grants applicable for the commencement of a comprehensive NEMO program

IV. PROJECT DESCRIPTION

CZM has acquired many of the components that are needed to develop, implement and operate a comprehensive Geographical Information Systems office (GIS office) within the division. Hardware that has been acquired includes Geographical Position System units, plotters, an E-size scanner, several computers that are capable of GIS functions and digital cameras. Software that has been used in the past includes ArcView 3.2 and ArcGis 8.2. The Division has also acquired a significant amount of geospatial data, including NOAA Benthic Habitat mapping products, numerous shapefiles and other material from the University of the Virgin Islands and other producers of GIS data.

The Fellow will be expected to inventory the Division's needs and requirements and move expeditiously to develop a functioning GIS office. CZM will acquire any components (hardware or software) that are necessary to assist the Fellow in developing and operating the GIS office. The primary goals and objectives have been outlined and elaborated on above, but consist of the following:

1. Development of a database that can be utilized by CZM personnel;

2. Collaboration with CZM personnel to achieve the goals and objectives of individual projects and programs;
3. Staff training; and
4. Assist in the development of a NEMO support group.

Current and future CZM offices and programs that can contribute data to the project include the St. Thomas and St. Croix permits offices, the territorial coral reef monitoring program, several coral management projects (STXEEMP), the water quality monitoring program, the monitoring of commercially important and/or threatened species and the tracking of resource use patterns. Other organizations (see project partners) are engaged in projects to collect natural resource data as well, such as watershed and wetland delineation and assessments, water quality data, data on marine species, and habitat mapping. The Fellow should work with staff from all of these agencies to collect and compile the various data and develop it into a comprehensive database. During the project term, the Fellow will be expected to research additional sources of data, collect and compile the relevant data, incorporate data into a geospatial database and work with CZM staff to design appropriate queries. It is expected that after consultation with CZM staff to assess needs the Fellow will work relatively independently to assemble the data and develop the database. Design of data queries will be an on-going process as resource managers and the Fellow use the database to answer study design and management questions. This database will assist resource managers within CZM by establishing a centralized, efficient, responsive, geospatial data management tool, thereby allowing for the collection and manipulation of increasingly rigorous scientific data for planning purposes.

As part of the overall project, the Fellow will be expected to assist in the establishment of a preliminary NEMO working group composed of the appropriate staff from various agencies with an interest in developing a NEMO program for the USVI. This working group will function to advise and guide the development of a NEMO program, and serve as a base for leveraging resources for future NEMO-related endeavors. Collaborators who participate in the working group may be allowed access to the geospatial framework designed by the Fellow as a springboard for future efforts. It is expected that this working group will continue to function beyond the tenure of the Fellow as the territory looks to develop a comprehensive NEMO program.

V. FELLOW MENTORING

The assistant will be mentored by Bill Rohring, Assistant Director for the St. Thomas/St. John District. Bill primarily works in the VICZMP St. Thomas office, but does visit St. Croix several times per month. He is responsible for writing grant proposals and maintaining grants received by the Division as well as managing the day-to-day operation of the St. Thomas/St. John Offices. He also is responsible for project development and oversight for these offices and the programs run from them. In addition, he is involved with permit reviews, watershed-based planning, Nonpoint Source Conference planning, and the development and implementation of a local action strategy for land-based sources of pollution. Bill will be the primary point of contact for administrative questions and project guidance.

The GIS Fellow will be considered part of the VICZMP, and will be expected to attend staff meetings and participate in program discussions. The Fellow will be provided opportunities to join staff on field visits, and in internal and external meetings. The assistant will have ample opportunities to meet and interact with a number of GIS professionals and resource managers within all levels of government, nonprofit groups, and academic institutions. This project will provide an exciting opportunity to learn about aspects of a natural resource management program and a wide range of island management issues.

The Fellow will receive assistance in identifying key individuals with whom to meet and important sources of background information. They will be provided with the necessary resources to carry out the project. As CZM is familiar with the Coral Management Fellows Program, it will ensure the Fellow will have the travel and training opportunities that are in the contract with the Environmental Careers Organization.

VI. PROJECT PARTNERS

The Fellow will be located within the Department of Planning and Natural Resources (DPNR), CZM offices on St. Thomas. CZM will provide office space, equipment, supplies and supervision.

The Fellow will work closely with a number of local and federal partners, particularly to compile existing datasets and research other initiatives/projects that may be incorporated into the NEMO tools he/she is developing. The following list includes potential project partners, additional partners may be identified as the program is developed and implemented.

- **Division of Environmental Protection (DEP)** – DEP is the division within DPNR charged with enforcing various anti-pollution laws and regulations throughout the Territory of the U.S. Virgin Islands. DEP collects water quality data territory wide, and is the agency charged with the development of plans to meet Total Maximum Daily Load requirements of the federal government.
- **Division of Fish and Wildlife (DFW)** – DFW is the division within DPNR charged with managing and collecting scientific data on the Territory's fishery and wildlife populations. DFW collects data and conducts research on fishery and wildlife resources territory wide.
- **Conservation Data Center (CDC)** – The CDC is a unit within the Eastern Caribbean Center at the University of the Virgin Islands (UVI). The CDC compiles, analyzes, and disseminates natural resource data in geospatial format.
- **Center for Marine and Environmental Studies (CMES)** – CMES is a division within the Research and Public Service arm of UVI. CMES generates various data on tropical marine environments.
- **The Nature Conservancy (TNC)** – TNC is a non-governmental agency that participates in many projects involving watershed and natural resource planning and management within the territory.
- **Island Resources Foundation (IRF)** – IRF is a non-governmental agency involved in many Caribbean watershed and natural resource planning activities. They house an extensive resource library.

- **NOAA Biogeography Program** – The Center for Coastal Monitoring and Assessment Biogeography Team is a partner in many resource management and mapping projects in the territory. They developed the benthic habitat maps for the area and continue to generate geospatial and bathymetric data for the coastal waters of the USVI.
- **National Park Service (NPS)** – NPS offices in both St. Croix and St. John have data libraries on their relative natural resources.
- **Others** - Other partners could include local nonprofit organizations, other agencies within the local or federal government, various companies, and individuals, depending on the project or data being sought.

VII.COST SHARE DESCRIPTION

The assistant will have access to all of the amenities and services of agency staff, including office space and equipment, computer, telephone, fax, and e-mail. Use of agency vehicles will be permitted.

In addition to providing the annual $7,500.00 cost share out of Program Income, the VICZMP will provide funds for administrative travel, purchases of supplies and software, as well as printing, photocopying, mailing, and incidental costs for project products.